MEDFRAMES, AN OBJECT-ORIENTED ELECTRONIC MEDICAL RECORD REPRESENTATION SYSTEM

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We are developing a graphical, object-oriented system to represent a patient's medical record. Our object system is based on the frame(schema)-based knowledge representation concept, implemented as a research-laboratory planner, LABFRAMES[1,2] and as an educational conceptualization tool for students[3].

A powerful feature of frame-representation is that frames can be linked to other frames as in medical expert system shells, and can be incorporated into one or more expert system applications. The frame based representation scheme stands on its own, however, as a flexible system for representing diverse data structures[4] .

We are using MEDFRAMES to represent portions of the medical record. Under this paradigm, the patient is one frame, with a variety of attributes, including medical history, symptoms, clinical findings, etc. Each of these attributes can also be represented as frames, with well defined attributes of their own. The medical history frame consists of a collection of patient data including prior diagnoses, medications being taken, drug allergies, familial diseases, demographic data, etc. Individual frames can be linked to other frames providing a convenient and graphical method to display patient profiles that aid in diagnoses.

The MEDFRAMES prototype is being developed in Common Lisp. We eventually plan to transfer MEDFRAMES to the Lisp-like language *Dylan* ® Apple Computer, or a similar object-oriented dynamic language which will be used to program systems using Apple Newton technology. Newton technology provides for handwriting recognition with hand-held devices that will readily permit physicians, nurses and others to enter and review data at the actual time their encounter with the patient. The data can be linked to other larger computers via infra-red, direct cable, modem and conventional telephone or cellular phone . This will permit direct and immediate access to the complete medical and other patient data at the time a patient is being seen. Voice input will be ultimately be possible.

Reference

[1]. Abdulezer, L. and Roffman, S. Logo in the Business and Professional Environment. Proceedings of the Logo 85 Conference, Sponsored by the Laboratory for Computer Science, Massachusetts Institute of Technology, Cambridge, MA, 1985.

[2]. Abdulezer, L. Programming without Programming. Proceedings of the Logo 86 Conference, Sponsored by the MIT Epistemology and Learning Group, Massachusetts Institute of Technology, Cambridge, MA, 1986.

[3]. Roffman, S. Knowledge Representation in Logo, a Conceptualization Tool for Students. *ibid.*

[4]. Minsky. M. A Framework for Representing Knowledge in Psychology of Computer Vision,P.H. Winston, ed., McGraw Hill, New York, 1975.

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